

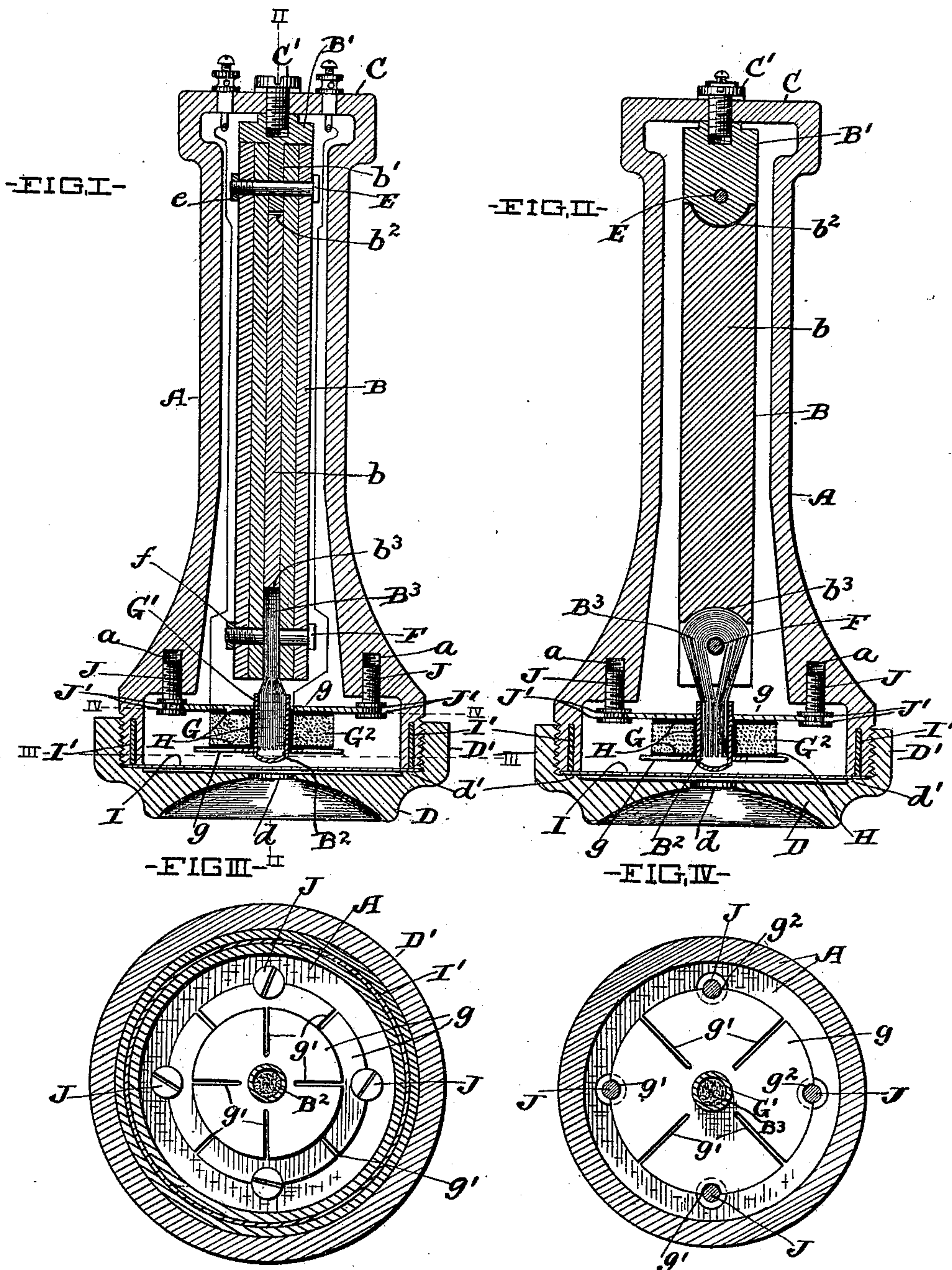
No. 631,354.

Patented Aug. 22, 1899.

J. A. WILLIAMS.
TELEPHONE RECEIVER.

(Application filed Apr. 9, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

JOSEPH A. WILLIAMS, OF CLEVELAND, OHIO, ASSIGNOR TO THE WILLIAMS ELECTRIC COMPANY, OF SAME PLACE.

TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 631,354, dated August 22, 1899.

Application filed April 9, 1898. Serial No. 677,035. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. WILLIAMS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Telephone-Receivers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in telephone-receivers.

The primary object of the invention is to so support the bobbin from the case and to so construct the bobbin and engaging magnet-pole that the space between the pole-tip and diaphragm shall not be affected by expansion and contraction of the case and magnet and that rough or careless handling of the instrument shall not affect the adjustment of the bobbin and its engaging magnet-pole.

With this object in view and to the end of attaining other advantages hereinafter specified and to render the instrument light, durable, and efficient my invention consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure I is a side view, mostly in longitudinal section, of an instrument embodying my invention. Fig. II is a longitudinal section on line II II, Fig. I. Fig. III is a transverse section on line III III, Fig. I. Fig. IV is a transverse section on line IV IV, Fig. I, looking in the direction of the arrow.

Referring to the drawings, A designates the tubular or hollow case of the instrument, which case is preferably made of polished ebonite or vulcanized rubber in the usual manner.

B designates the permanent magnet, that is suitably arranged within and longitudinally of the case A. The said magnet is in the case illustrated of the compound or laminated variety and is made up of five bars provided with iron poles B' B², partially embraced by opposite ends, respectively, of the central bar b of the magnet.

The case A at one end is provided with the binding-post bearing-head C and at its op-

posite end has the earpiece D. Pole-piece B', and consequently the magnet, is secured to head C by the screw C'. The said pole-piece B' is provided with an ear b', that extends between the four outer bars of the magnet and engages a recess b², formed in the adjacent end of the magnet's central bar, that therefore partially embraces the said ear widthwise of the said bar. A bolt E, that extends through the said ear and through the four outer bars of the magnet, together with a nut e, that is mounted upon the threaded shank of the bolt, clamps the said bars of the magnet and ear together. The other pole of the magnet comprises, preferably, a bunch of soft-iron or magnetic wires B³, that are bent around a bolt F, employed in securing together the other ends of the bars of the magnet and that have their ends crowded into but slidable endwise of the hollow hub or core G' of the bobbin G, which core is composed of suitably-magnetic material—such, for instance, as soft iron—and forms a part of the magnet-pole, comprising the said wires, and constitutes the tip of the said pole. The central bar of the magnet is recessed, as at b³, to accommodate its partially embracing the bend in the said iron wires, as shown in Figs. I and II. The bolt F, around which the said wires are bent and that extends through the four outer bars of the magnet, and the nut f, that is mounted upon the threaded shank of the said bolt, hold the said wires and the magnet-bars together. It will be observed, therefore, that the central bar of the magnet is positively prevented from edgewise displacement laterally of the instrument by the members or portions of the pole-sections that are partially embraced by the said bar.

The instrument's earpiece is provided with a centrally-located aperture d in the ordinary manner.

Case A is enlarged diametrically in the usual manner at its bobbin-containing end, that is annular and provided externally with screw-threads engaged by the correspondingly internally threaded annular flange B' of the earpiece, that at the inner end of its flange and internally is provided with an annular shoulder d', arranged to hold in place against the adjacent end of case A the dia-

phragm I, that is arranged in suitable proximity to the pole-tip-forming portion of the bobbin. The bobbin is adjustable toward and from the diaphragm to accommodate the formation of the space required between the diaphragm and the tip of the adjacent magnet-pole, and the wire coil G^2 of the bobbin is carefully insulated. The bobbin at its ends is provided with brass or non-magnetic heads g , that to avoid eddy-currents are provided with any suitable number of radially-arranged slots g' , arranged, preferably, equidistant apart.

H designates the insulation between the coil and the heads and core of the bobbin and is indicated by heavy black lines. The bobbin's inner head is diametrically larger than its outer head and is engaged at its edge by screws J, that support the bobbin and engage correspondingly-threaded holes a , formed in and longitudinally of case A. In the case illustrated four screws J are arranged at equal intervals circumferentially of the bobbin, and each screw has two annular shoulders $J' J'$, arranged apart a distance equal to the thickness of the bobbin's inner head that snugly fit, therefore, between the said shoulders, and the screws between the said shoulders snugly engage said head, that in its surrounding edge has slots g^2 , having arc-shaped walls that partially and snugly embrace the screws. By this construction the bobbin, and consequently the pole-tip that forms a part of the bobbin, cannot possibly become displaced independently of the supporting-screws neither endwise nor laterally nor circumferentially, and it is obvious that with the coil-embraced and bobbin-forming pole-tip and body portion of the pole shiftable endwise independently of each other and with the diaphragm and bobbin and pole-tip supported from the bobbin-containing end of the case no expansive or contractive influence upon the case or upon the magnet can affect the relative positions of the said diaphragm and pole-tip, and consequently the said space having been once properly established will not be varied by the aforesaid influence so as to affect the efficiency of the instrument.

The shiftability and lateral flexibility of the body portion of the magnet's coil-embraced pole with the magnet-bars accommodates rough or careless handling of the instrument without liability of displacing the tip of the said pole.

I' designates a ring or short shell of soft iron or other magnetic material. This shell

is within the bobbin-containing end of case A and abuts and forms an inward extension of the diaphragm I. The said shell does not, however, extend to the narrower or magnet-bar-containing portion of the case. The said member I' forms a partial return-path for the lines of magnetism and induces more lines to pass into and through the bobbin, if, as in the case illustrated, it does not extend inwardly too far. An extension of the said member I' inwardly beyond the inner end of the bobbin would be detrimental, because it would induce a shorter path for the magnetic lines from the bobbin-embraced pole to the opposite pole.

What I claim is—

1. In a telephone-receiver, the coil-bearing bobbin supported independently of the magnet and provided with a magnetic hub or core that forms the tip of the adjacent pole of the magnet, and the body portion of the said pole consisting of magnetic strands or wires bunched and shiftable within the aforesaid tip and suitably attached to the adjacent portion of the magnet, substantially as set forth.

2. In a telephone-receiver, the combination with a case and the bobbin within the diaphragm-bearing portion of the case and having a head; of devices straddling the head at the latter's surrounding edge and at suitable intervals along the said edge, which head-straddling devices have members or portions thereof overlapping opposite sides or faces of the head and are supported from the case, and shiftable, as required, to adjust the bobbin relative to the diaphragm.

3. In a telephone-receiver, in combination with the case and bobbin within the diaphragm-bearing portion of the case and having a head, of screws having shoulders engaging or overlapping opposite sides, respectively, of the said head and screwed into the case, substantially as set forth.

4. In a telephone-receiver, in combination with the case and bobbin within the case, and having a head provided in its surrounding edge with recesses arranged at suitable intervals, of screws extending through the said recesses into the case, and each screw having shoulders overlapping opposite sides, respectively, of the head, substantially as set forth.

Signed by me at Cleveland, Ohio, this 5th day of April, 1898.

JOSEPH A. WILLIAMS.

Witnesses:

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